

## SYSTEMS AND METHODS FOR THREE-DIMENSIONAL MODELING

Abstract

Systems and methods for modifying a virtual object stored within a computer. The systems and methods allow virtual object modifications that are otherwise computationally inconvenient. The virtual object is represented as a volumetric representation. A portion of the volumetric model is converted into an alternative representation. The alternative representation can be a representation having a different number of dimensions from the volumetric representations. A stimulus is applied to the alternative representation, for example by a user employing a force-feedback haptic interface. The response of the alternative representation to the stimulus is calculated. The change in shape of the virtual object is determined from the response of the alternative representation. The representations of the virtual object can be displayed at any time for the user. The user can be provided a force-feedback response. Multiple stimuli can be applied in succession. Multiple alternative representations can be employed in the system and method.

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